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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,704	09/30/2003	Tony A. Opheim	42.P16903	4545

7590 04/19/2005
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EXAMINER

ANDUJAR, LEONARDO

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/674,704	Applicant(s) OPHEIM, TONY A.	
	Examiner Leonardo Andújar	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 20-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I (claims 1-7 and 20-27) in the reply filed on 04/05/2005 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3-7, 20, 22-24 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Gnadinger (US 5,229,647).
4. Regarding claim 1, Gnadinger (e.g. figs. 4 and 6) shows an apparatus, comprising: a first end of a via 21 disposed in a semiconductor support layer 10, the first end (bottom end) having a first diameter; and a second end of the via having a second diameter (top end), the first diameter greater than the second diameter.

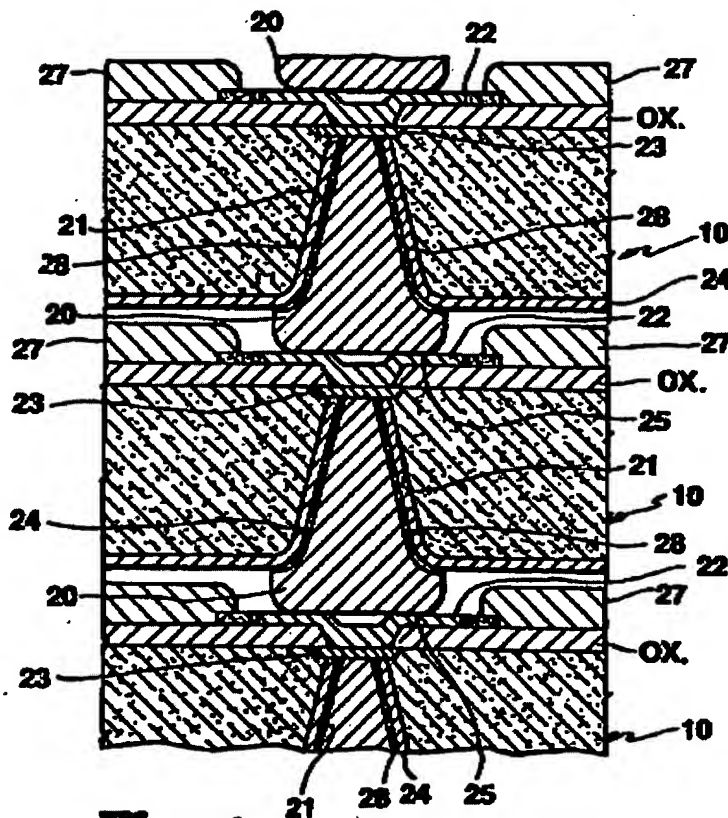


Fig. 4

5. Regarding claim 3, Gnadinger shows that the first end forms a semi-cone in the semiconductor support layer.
6. Regarding claim 4, Gnadinger shows that a dielectric layer 24 disposed proximate to the semiconductor support layer, the via to pass through the dielectric layer (e.g. fig. 6).
7. Regarding claim 5, Gnadinger shows that a diameter of the via in the dielectric layer is similar to the first diameter.
8. Regarding claim 6, Gnadinger shows a contact 43 disposed on the dielectric layer and electrically coupled to the via.

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9. Regarding claim 7, Gnadinger shows that the via includes a metal-filled via 20.

10. Regarding claim 20, Gnadinger (e.g. figs. 4 and 6) shows a die package, comprising: a semiconductor support layer 10 including a via 21 having a first end (bottom end) and a second end (top end) in the semiconductor support layer, wherein a diameter of the first end is greater than a diameter of the second end; a dielectric layer 24 disposed proximate to the semiconductor support layer wherein the via passes through the dielectric layer; and a contact disposed 43 on the dielectric layer, the via coupled to the contact.

11. Regarding claim 22, Gnadinger shows that the first end is a semi-cone shape centered on the via.

12. Regarding claim 23, Gnadinger shows that the a diameter of the via through the dielectric layer is similar to a diameter of the semi-cone shape

13. Regarding claim 24, Gnadinger (e.g. figs. 3, 4 and 6) a system, comprising: a printed circuit board (PCB) 17 and a processor 10 coupled to the PCB (col. 3/lls. 26-27 & col. 6/lls. 1-5) The processor includes a semiconductor support shows a die package, comprising: a semiconductor support layer 10 including a via 21 having a first end (bottom end) and a second end (top end) in the semiconductor support layer, wherein a diameter of the first end is greater than a diameter of the second end; a dielectric layer 24 disposed proximate to the semiconductor support layer wherein the via passes through the dielectric layer; and a contact disposed 43 on the dielectric layer, the via coupled to the contact.

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14. Regarding claim 27, Gnadinger the first diameter is approximately twice the second diameter.

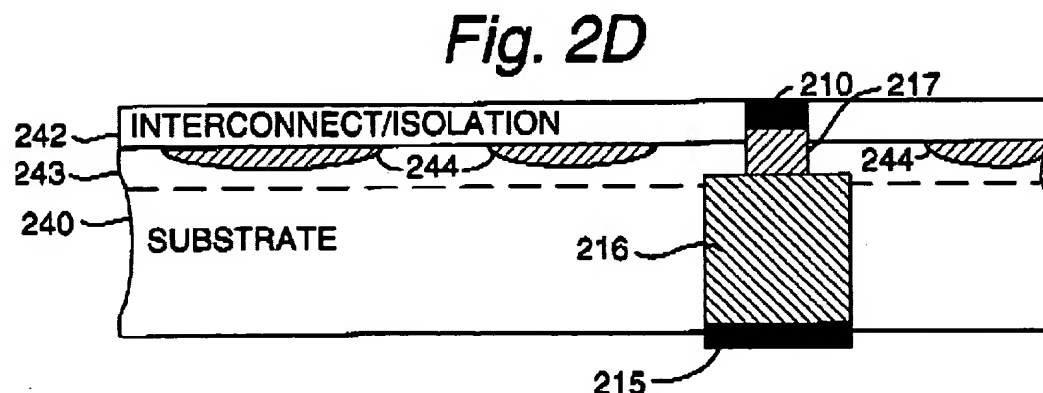
Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 2, 21, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gnadinger (US 5,229,647) in view of Hsuan (US 6,429,509).

17. Regarding claims 2, 21 and 25, Gnadinger shows most aspects of the instant invention except for a shaft between the first end and the second end wherein the shaft has a diameter similar to the second diameter. Nevertheless, Hsuan (e.g. fig. 4D) a via including a shaft between a first end 216 and the second end 217 wherein the shaft has a diameter similar to the second diameter.



According to Hsuan, this type of interconnection minimizes the I/O signal attenuation, inductance and capacitance of integrated circuit (col. 3/lls. 42-45). It would

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have been obvious to one of ordinary skill in the art at the time the invention was made to make the vias disclosed by Gnadinger having a shaft between the first end and the second end wherein the shaft has a diameter similar to the second diameter in accordant to Hsuan's invention to minimize the I/O signal attenuation, inductance and capacitance of integrated circuit.

Regarding claim 26, Gnadinger in view of Hsuan shows most aspects of the instant invention including a via. Gnadinger in view of Hsuan does not explicitly disclose a via where the first end tapers outwards from a center of the via within a semiconductor support layer towards the dielectric layer wherein the first end defines a semi cone shape in the semiconductor support. However, this limitation, absent any criticality, is only considered to be an obvious modification of the shape via disclosed by Prior Art as the courts have held that a change in shape or configuration, without any criticality, is within the level of skill in the art as the particular shape claimed by applicant is nothing more than one of numerous shapes that a person having ordinary skill in the art will find obvious to provide using routine experimentation based on its suitability for the intended use of the invention. It would have been an obvious matter of design choice to make via disclosed by Gnadinger in view of Hsuan having the first end tapering outwards from a center of the via within a semiconductor support layer towards the dielectric layer wherein the first end defines a semi cone shape in the semiconductor support since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. See *In re Dailey*, 149 USPQ 47 (CCPA 1976).

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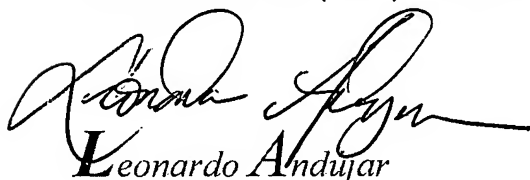
Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Clements shows structures and procedures similar to the instant invention.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Leonardo Andujar

Patent Examiner
Art Unit 2826
04/14/2005